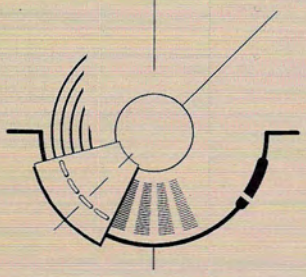
TELEPHASSA



KATHOLIEKE UNIVERSITEIT BRABANT

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University of Patras

SYNAR
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2 Available Sources of Online Information

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2.1 INTRODUCTION

In this report we present a classified and briefly described overview of the information sources available. Within this frame, we focus our attention on electronic information sources and discuss some of their features.

Volume figures are provided for the various online market sectors and future new trends are pointed out, according to the latest developments.

2.2 TYPES OF INFORMATION SOURCES

Two types of information media can be identified in our society nowadays - Electronic and Traditional media (see Figure 1).

TRADITIONAL	ELECTRONIC		
Paper	**Passive**	**Broadcasted**	**Interactive**
texts, graphics	tapes	radio	**Communications**
books, journals	records	TV	telephone
newspapers, reports	cassettes	teletext	fax
	video	(data broad-casting)	teleconference
Microforms			electronic mail
People			**Information**
			online (remote access)
conferences and meetings			local system / stand alone
fairs			(CD-ROM)
courses			
person-to-person communication			

2.2.1 Traditional

These types are divided into **Paper** and **Interpersonal Contacts** although some authors would also add **Microforms** (microfilms and microfiches) which show different features; nevertheless, they are still types of paper.

These traditional media are still very much in use and far from fading out; they are actually on the increase, as is shown, for instance, by paper production statistics.

Personal contacts between professionals are also becoming more and more frequent thanks to cheaper and easier travel. Electronic mail is becoming more popular day by day since it makes contact easier, but it is no substitute for meetings (conferences, courses, etc.).

2.2.2 Electronic

They can be:

- **Passive**
  In this category information is recorded permanently and it is always received by the user in the same way and in the same sequence.
- **Broadcast**
  Information is broadcast simultaneously to a large number of users from an aerial. In addition to radio and television, there is data broadcasting through television channels (teletext) and specialized radio stations.
- **Interactive**
  A dialogue is established between two or more users in the information network.

They can be a means of **Communication** or of **Information**. They both have much more in common than would initially appear. Thus, for instance, teleconference systems can be considered dynamic databases where authors and readers practically interact in real time. On the other hand, traditional databases are also communication systems between writers and readers, although, usually with a few months' time in between.

The interactive electronic information systems can be **online for remote access** and **online for local access**. The former, based on the institution computer or CD-ROMs, are called stand-alone systems.

2.3 ONLINE REMOTE ACCESS

The online remote systems of access to information can be divided into five groups.

2.3.1 Texts and references

They are the traditional ASCII services, particularly giving information on science, technology or medicine (STM). The hosts ESA-IRS, Dialog, STN, etc. belong to this group.

Databases are searched through more or less sophisticated professional languages, although the menu systems have proliferated recently.

2.3.2 Videotex

These systems differ from the previous ones because they codify the information according to various CEPT standards (which, by the way, are mutually incompatible) that allow the information to be displayed on the screen in colour-designed graphics. They are menu driven.

2.3.3 Academic and research/general, ASCII

On the one hand, the university systems incorporate OPACs (online public access catalogues) or online book catalogues, and on the other hand, the communication systems between university members, from electronic mail to debate groups and teleconferences [forums, bulletin board systems (BBS), etc.]. They use university networks, such as Earn-Bitnet or Internet. Most of them are free of charge, although this group could include commercial host groups accessible through public networks, such as **CompuServe** (1,100,000 users).

Apart from this last one, in the USA there are some very popular online services addressed to the general public that are increasing the number of their users very quickly: **Prodigy** (2,100,000 users), **GEnie** (350,000 users) and **America Online** (200,000 users). It is difficult to consider them into this group or in the videotex one.

Finally, this group could also include private-use BBS, usually managed by students, who provide services with a microcomputer from their homes.

2.3.4 Real time

These provide up-to-date information on the stock exchange rates, commodity markets and products, so that immediate action can be taken (sales and purchases). Sometimes they are **transactional** if they can carry out these actions from the information system itself. For example, **Reuter, Telerate, Quotron.**

2.3.5 Private

Their access is restricted to a group of users within the same organization or association. Such as **AppleLink** for Apple personnel and distributors, **ESA Information System** for the European Space Agency staff and contractors, **Swift** between banks, **Sita, AMR, VAL, Pars** for airlines, **Istel** for travel agents, **Resinter** for hotels, and so on.

2.4 ONLINE MARKETS AND THEIR FEATURES

In order to give an idea of the size of the previous groups, we include some statistics. Online market values must be handled with caution, given the difficulties encountered when they are defined or their figures are obtained. Their main interest lies in their relative values.

2.4.1 What is 'online'?

The integration of information technology and services, which will be dealt with later, invoicing criteria, and other factors, make it difficult to mark the boundaries between the many services and their actual turnover. To start with, there is some confusion about the term **online** itself, and what should be understood by it.

For instance, videotex is an online system, but it is not usually understood as such, and it is entered as a separate entity. On the other hand, in the USA, the menu-searched ASCII systems are called also videotex.

And should CD-ROMs used in multi-user systems be considered online hosts? The London International Online Information Meeting has been presenting CD-ROM products as **local online** systems. From 1992 this meeting has been renamed **Online/CD-ROM Information**, something that has been questioned by some authors because it implies that CD-ROMs cannot be consulted online.

Since they are part of real-time services, some statistical time-series databases, which would normally be entered as STM services in Dialog, DataStar, etc, are nevertheless an integral part of the real-time service market.

There are also hosts which have references as well as numeric databases. Statistics are not quite precise about them and they are assigned in block to one group or another, whichever is the predominant one.

The Official Airlines Guide (OAG) offers transactional services (flight bookings) in the USA and Canada, but not in Europe.

Information services are often subsidized or managed by public administrations, who make them available free of charge or at lower-than-market prices. Should they really be considered 'market' services? The same question would apply to OPACs (online public access catalogues).

It is equally difficult to mark the boundaries between private services, restricted to a more or less wide range of users, and those fully public, and also between educational, training and professional databases.

With reference to 'market' values, it is important to know whether they include online service purchases as well as sales. That is to say, for instance, if we are referring to the Italian market, whether only the Italian host sales, within and outside Italy, are taken into account, or the use of foreign hosts in Italy (Dialog, STN, etc.) is also considered. Usually, only the sales through the home host should be taken into account. Nevertheless, how should services served through a foreign-based gateway be classified?

2.4.2 Markets by topics

A classification of online information, according to format and medium, has been given in section 3. *Link Resources* present their statistics according to their content, and make seven classifications:

- **Vertical market operational (VMO)**
  They are specialized markets embracing a closed sector, such as transport, insurance, meteorology, real estate, etc.
- **Credit**
  In the USA, this sector of commercial solvency reports is controlled by Dun & Bradstreet in company credits and by TRW in personal credits.
- **Financial-economic**
  Shares, bonds, foreign exchange, economic statistics. It is the most buoyant market, although it tends to have a stable number of companies dedicated to this type of information. It is hard for new firms to penetrate this market because a very large investment is needed; moreover, there is a 'battle for the user's desktop space'. These services use special terminals and subscribing to a new service means adding another terminal to the desktop.
- **Marketing/mass media**
  It includes TV viewers, demographic DBs, mailing lists, advertising, product performance and mobility analysis, etc.
- **Legal/government**
  Legislation, case laws, patents and trade names.
- **News**
  Periodical full-texts, news agencies, trade news.
- **STM**
  Science, technology, and medicine, the oldest sector.

USA electronic information profits
1991 forecast

Type of information	Profits (in millions of $)	Total %
VMO	2,563	22.8
Credit	2,225	19.8
Financial/economical	3,080	27.4
Marketing/media	1,733	15.4
Legal/Government	706	6.3
News	598	5.3
STM	332	2.9
TOTAL	11,237	100.0

Source: Link Resources

Services with the most customers Special terminals (1990)	
Company/service	Number
Reuters	205,000
Dow Jones/Broadtape	132,000
Telerate/Telerate QMC	85,000
Quotron/Financial Inf. Services	85,000
ADP/Brokerage services	70,000
Data Transmission Network/DTN Ag. daily	54,000
Standard and Poor's/Marketscope	44,000
Knight Ridder/Moneycenter	25,000

Source: Simba Information Inc.

Services with the most customers Passwords (1990)	
Company/service	Number
IBM-Sears/Prodigy	800,000
Compuserve	790,000
Dow Jones News Retrieval	330,000
Mead Data Central/Lexis, Nexis, Medis	301,000
Geis/GEnie	250,000
British Telecom Tymnet/Dialcom	236,000
Quantum/Q-Link, America Online	130,000
Dialog/Dialog, VU-Text	130,000
General Videotext/Delphi	73,000
Dun & Bradstreet/Dunsprint	72,000
Maxwell Online/Orbit, BRS	68,000
Equifax/Credit Services	61,000
Official Airline Guide/OAG Online	40,000
National Library of Medicine/Medlars	38,000

Source: Simba Information Inc.

Text and reference DBs host profits	
Host	Profits (US million $)
Mead Data Central (Lexis, Nexis)	401
Dialog	130
Maxwell Online (Orbit, BRS)	50
Reuters ('historical' information)	22
Data-Star	15
STN International	15
Questel	12
Dow Jones News Retrieval	8.5
National Library of Medicine	5
Dimdi	3
European Space Agency - IRS	2.5
All others	18

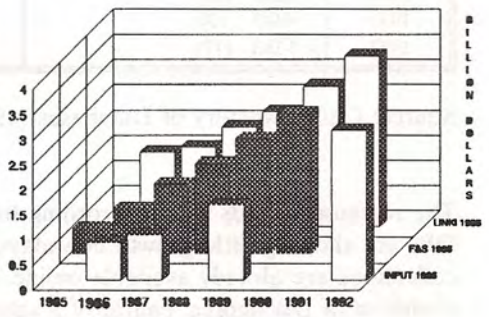
Source: Electronic Publishing Services Ltd. (1990)

2.4.3 European online market

Several consulting firms forecast the growth of the European market between 1986 and 1988, and the EEC Information Market Observatory (IMO) published the following graphic:

European Online Database Market

Market Research Forecasts



Year

Nevertheless, during the last few years, there has been a world-wide crisis, partly due to the Gulf War in 1991, which had a more marked effect on Europe. The figures forecast in this graphic were not reached.
The DB volume in European industry is about 1/3 of the USA volume, although some authors give lower figures. Europe has Reuters, which makes up a large percentage of the total and distorts the real situation in Europe.

2.4.4 Online database offer

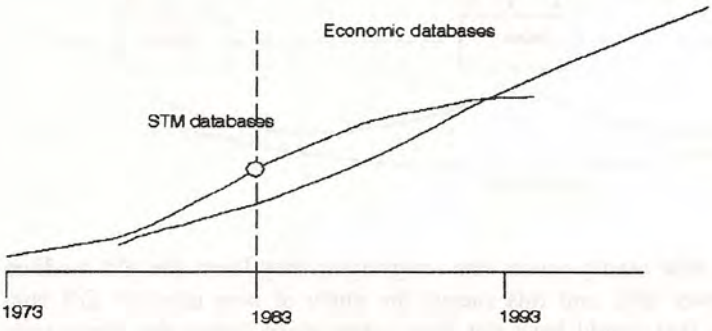
Although there are other DB directories, traditionally, Carlos Cuadra's (now merged with Martha Williams' by Gale Publishers) are the directory that set the pace as far as the increase in the number of DBs, producers, and hosts is concerned.

World-wide DB growth figures and percentages

Year	DBs	(%)	Producers	Hosts
1978	300		221	59
1979	411	(37)	269	71
1980	641	(56)	411	135
1981	919	(43)	612	189
1982	1360	(48)	820	244
1983	1807	(33)	1069	327
1984	2247	(24)	1316	414
1985	2369	(5)	1379	454
1986	2823	(19)	1568	528
1987	3135	(11)	1685	555
1988	3535	(13)	1813	600
1989	3943	(12)	1950	645
1990	4332	(10)	2120	718
1991	4447	(3)	2033	772
1992	5183	(17)	2204	818

Source: Gale Directory of Databases (1993)

The increase in DBs varies according to subject. Science, technology and medicine DBs are showing little growth nowadays, since the most relevant manuals and data collections are already available online. The next graphic (see page 19) shows the evolution of DB figures, typical of a saturated or mature market.



2.4.5 CD-ROM

CD-ROM is clearly on an earlier development stage, showing high annual increase rates.

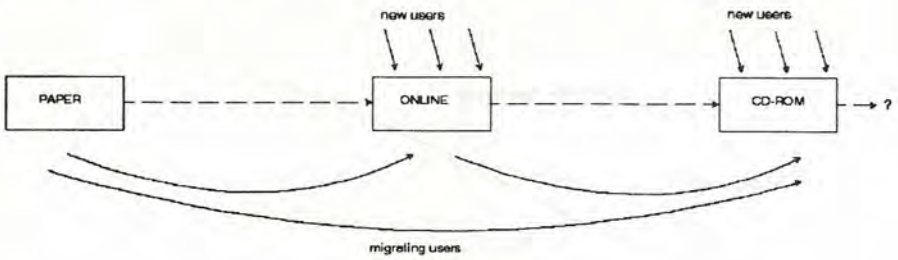
In 1991 there were 2200 titles for PC and around 480 for MacIntosh. CD-ROM production is very disparate. The leading world producer, SilverPlatter, had only 70 titles. The Dialog host offers 35, all of which are available online except one. In April 1993 SilverPlatter bought one of its main competitors, Compact Cambridge, thus assuring clearly its world's first position.

In 1991 there were around 850,000 drivers, 160,000 of them in Europe, and of these, 38,000 are in Italy. This is due to a company selling a tax information DB, which includes a CD-ROM driver in the same package.

Nevertheless, all these figures are only of historical interest since they increase very rapidly.

The high CD-ROM prices and the practice of controlling the user's identity (in order to make them return the obsolete discs) are a major handicap to their expansion. We will probably see that the 'few copies at a high price' policy will give way little by little to a 'many copies at a low price' policy, and it will thus be practically impossible to control the user's identity.

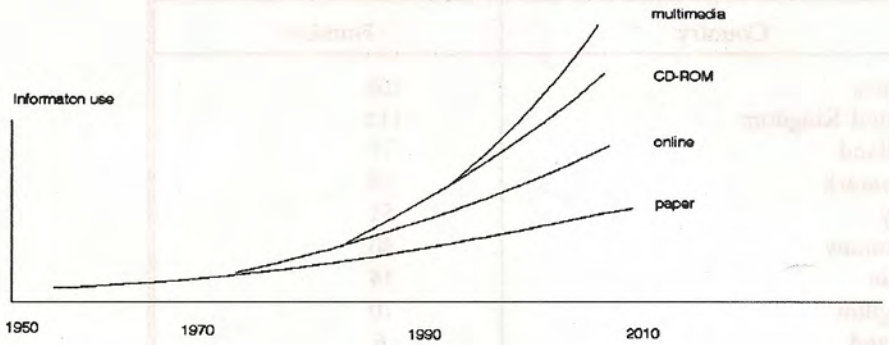
2.4.6 Paper, online, CD-ROM migration



The development of new media causes user migration; they leave the old medium to move on to a newer one, and this causes the entry of new users to DB consumption, something that would have not have taken place unless the new media had appeared.

Several factors condition the use of each of these technologies: fast information updating, prices, etc. The advantages and disadvantages of online and of CD-ROM have inspired many articles in the last few years; some of them appear in our references at the end of this study.

Unquestionably, the most relevant influence is the telecommunications factor, which, from the user's point of view, is a world apart because of its complexity, due to the high technicalities, very little help from the PTT, complex pricing (binomial -partly calculated by time spent and partly by characters sent and received), unforeseen costs, low reliability [the European average is 25% of failed attempts, according to the **Eurolug/Eusidic Monitoring Week**, which takes place in Europe every year, with better performance in countries like Germany and Holland (14%), and worse performance in countries like Spain (35%)], limited speed rate (compared to local systems). With a view to the future (in 10 years-time?), network availability of high rate/capacity Integrated Services Data Network (ISDN) will cause a radical change in the services provided by the present-day online database distributors, since they will be able to provide complex-document and multimedia databases.



2.4.7 Online source dispersion

Although databases represent a considerable effort towards the integration of printed information sources, the same DBs are then broken up into a large number of hosts, as is shown in table 4.4 and the following:

EUROPEAN DB PRODUCERS			
Country	Producers	Host-producers	H-p/P (%)
United Kingdom	191	36	19
France	170	25	15
Germany	108	11	10
Spain	42	23	55
Sweden	39	9	23
Italy	33	11	33
Holland	26	8	31
Belgium	22	1	4
Norway	18	9	50
Finland	13	3	23
Switzerland	12	3	25
Denmark	9	1	11
Others	12	1	-
TOTAL	695	132	19

Source: Cuadra/Gale (1989)

EUROPEAN COMMUNITY HOSTS (1988)	
Country	Number
France	168
United Kingdom	115
Holland	71
Denmark	53
Italy	51
Germany	40
Spain	14
Belgium	10
Ireland	6
Portugal	4
Luxembourg	3

Source: European Information Industry Association

Again, we find differing figures in the sources consulted, depending on what a host is considered to be. Some directories also consider hosts to be the database producers that provide online access service to it, even when it is a restricted access. This is the case with **Nordic databases (ed. 1992)**, which list 554 DBs from 226 hosts in Scandinavian countries:

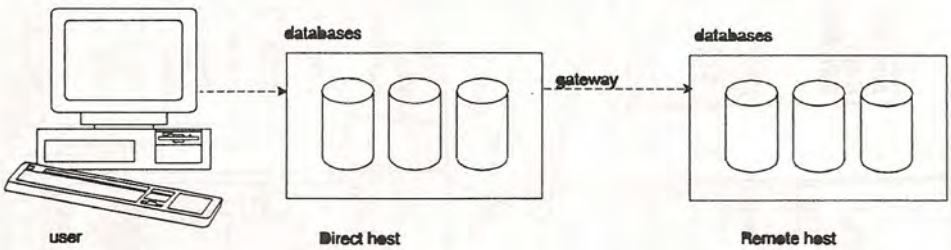
Denmark	88
Norway	62
Finland	43
Sweden	33
Total	226

The previous figures are considerably higher than those of Gale Directory, even taking into account the gap between their publication dates.
In order to solve their information needs, users often have to consult several sources in different hosts. With the exception of some 'boutique hosts' for very definite topics, in which they are self-sufficient and for which they have specialized software, hosts are only economically viable as information hypermarkets, with a large number of DBs.

As happened with journal articles, as Bradford pointed out years ago, DBs in the social sciences and the humanities are much more scattered than in technology. This is partly due to STM DBs being of universal application, while social sciences (including legislation, economy, and business) have a major territorial component, which forces a country or region to have their own. In some theme areas this breaking-up is also due to the fact that none of the DB-producing institutions have the means to create an all-embracing DB.

2.4.8 Gateways

A gateway is a telecommunications link between two hosts that allows a user, connected to a host, to consult the databases of another host without having to make a new telephone call.

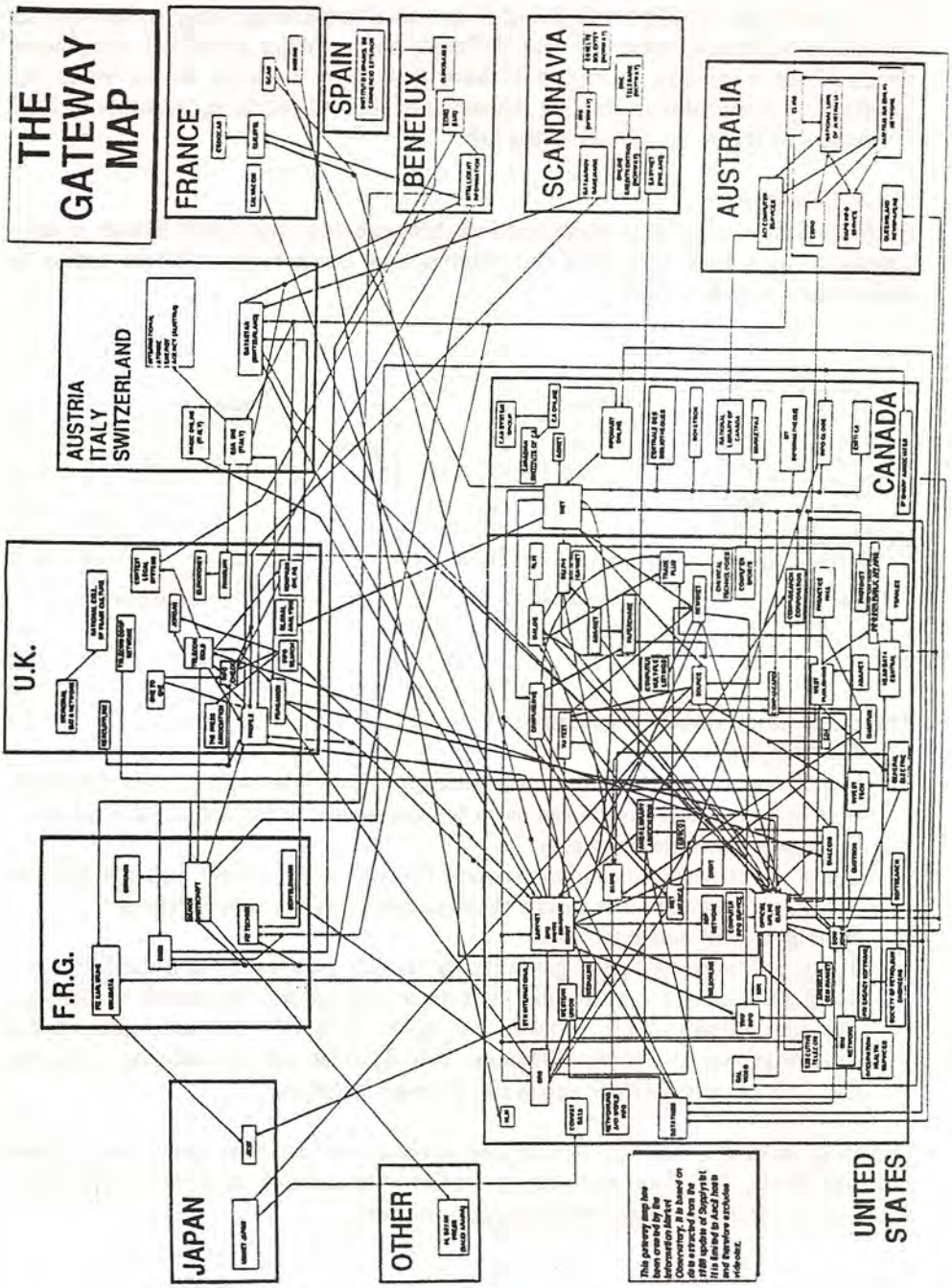


There are various kinds of gateways:

- **One way/two ways**
  Depending on whether the communication goes one way or two ways; the second kind allows both hosts users to have access to the DBs of the other.
- **Host-gateway or gateway only**
  There are telecommunications systems that can redirect calls and that have no databases loaded, that is to say, they are not hosts but only gateways.
- **Intelligent and non-intelligent**
  There are 'non-intelligent' gateways which only give access to a database, and 'intelligent' gateways which also convert or homogenize the search languages.
  The first gateways were installed during the early 80's and their number has steadily grown to a stable 200 units. This figure is only an estimate, since the last Gale directory (1993) omits the gateway statistics.

Gateways have the aim of solving the problem of database scattering around different hosts, but they are only a partial solution and they are hardly ever seamless or offer a transparent connection to users.

This page shows a gateway map published by the Information Market Observatory in 1988.



2.5 ONLINE INFORMATION SOURCES

With the existing database dispersion described in section 2.4.7, it is hard to know which are the ideal online databases and distributors for finding the right information. The uncertainties that may arise throughout this process are a main reason why the online systems are not widely used, particularly when the potential user has to start afresh. The best course of action for users to take is to go to a professional database consultant for advice or to get the searching done for them.

If there are no major changes in his working field, it is likely that the user will already have identified some databases capable of answering most of his questions.

When the subject is new, directories and catalogues will have to be consulted.

- **Catalogues of online database hosts**
  All hosts publish their catalogues where they describe the database content. They also offer online listings and descriptions, and some of them have systems to determine which database contains information on a particular subject (Dialindex in Dialog, Questindex in ESA-IRS, etc.).
- **Database directories**
  Many specialized directories have been published according to subjects or countries.
  There have been three great general directories: 'Computer Readable Databases' by Martha Williams, 'Directory of Online Databases' by Carlos Cuadra, and 'Database Directory' by Knowledge Industry Publications.
  The latter has been in financial difficulties and it is not known whether they will continue this publication. As it was said previously, the other two have been taken over by Gale Publishers and they have been merged together with another Cuadra's directory on CD-ROM, diskettes, etc. -'Directory of Portable Databases'. As a result, in January 1993 Gale published a very comprehensive **'Gale directory of databases'** in two volumes, with approximately 7,000 online and/or CD-ROM databases.
  This directory can be searched online from the hosts Data-Star, Dialog, Orbit, and Questel.
  In a different category, we find the EEC's "I'M Guide" (Information Market Guide, formerly "Dianeguide"), a not-so-complete directory, but free of charge; it is found in the Luxembourg Echo host. In 1993 it is being considerably updated by its new responsible organization, the European Information Industry Association (Eiia). It contains databases, CD-ROMs, and other products and services, as well as information brokers.

Internet online information
Through Internet, the academic network, it is possible to have free-of-charge access to many university catalogues around the world, as well as teleconference and information services. Some universities have Network Information Centres (NIC), which gather the available information resources and offer online listings.

Printed directories are also published, such as the Directory of Electronic Journals, Newsletters & Academic Discussion Lists (see references).

Multimedia and CD-ROM directories
Since the Cuadra 'Directory of Portable Databases' was integrated into 'Gale Directory of Databases', there are still another four outstanding general CD-ROM directories.

- **CD-ROM Information Products: The Evaluative Guide & Directory**
  Armstrong, C J: Large A.
  Gower Publ. Co/Ashgate Publ. Co

- **Multimedia Source Book, 1993**
  Hughes, Christine
  Myriad Tech FL

- **CD-ROM Market Place: An International Directory**
  Merkler Corp

- **CD-ROM Directory**
  Task Force Pro Libra (TFPL)

2.6 ONLINE EVOLUTION

Statistics on the use of online systems to access databases show that this sector, as it stands at present, has reached maturity, which means also its stagnation (see section 2.4.4).
Contrary to expectations, the proliferation of means of access (PCs and modems) among private users (end users), due to cheaper computing, did not represent a massive private use of DBs.
In the last few years online hosts have started to offer some services incorporating the full text of articles, newspapers, legal texts, etc. but with no images (drawings, graphics, photographs) because of:

- Cost of memory (disks) needed to store them
- Public network limitations in data transmission (1200-2400 baud)
- User equipment limitations to receive them and reproduce them.

Only Dialog and Questel hosts began to offer online images, but their real development will not take place until the general implementation of the integrated services digital networks (ISDN) which will allow transmission at rates of 64 Kbits/sec as a standard service to all homes and offices.

Some services supplying document photocopies have started digitalizing articles, storing them in computers and then sending them through data transmission lines. This subject is discussed in another presentation of this Telephassa Seminar.

As has been said in section 2.3.3 of this lecture, the electronic bulletins or BBS and teleconferences (debate and discussion forums, and information exchange) work through the academic networks, such as Internet. Over the last few years some universities have been offering electronic journals, written only for this medium and with no printed version. At present, these journals only offer a full text but they will probably 'publish' graphics and photographs as well in a few years' time. This possibility, together with the rising cost of printed subscriptions, has led several authors to predict that we are witnessing the birth of a new age in culture and science data transmission. The future reader will have access to electronic magazine databases, he or she will be able to select articles of interest, buy them and unload them into a PC or printer. These publications will only be on paper in the user's work place, if necessary.

Quality, one of the features emphasized by publishers about their printed journals, could be equally high in electronic ones, with good article selection and peer reviewing by an editorial committee, as at present, and the printing could be done in laser or ink-jet printers, which are becoming increasingly common everywhere.

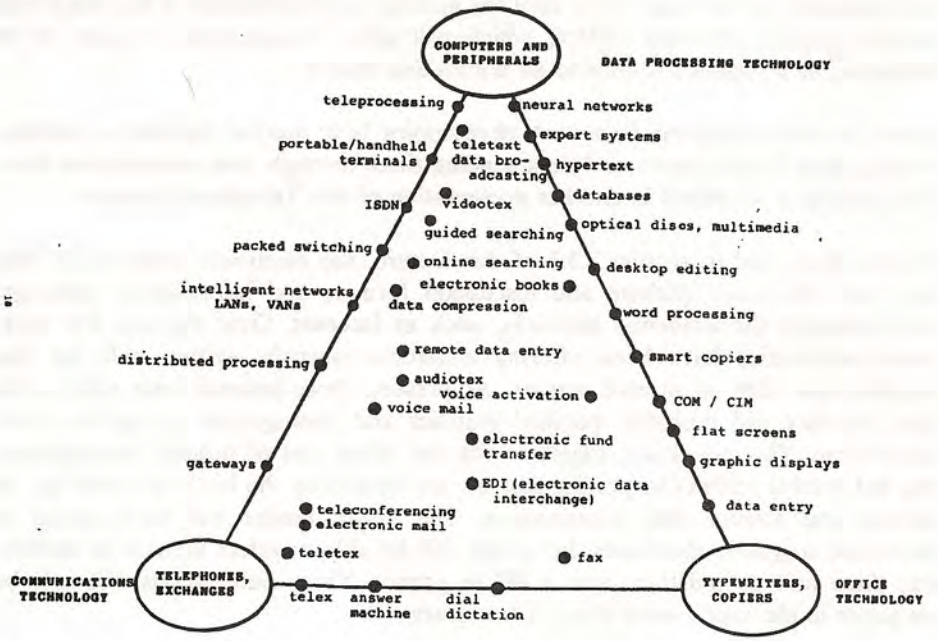
2.6.1 Technology integration

The next page shows a diagram based on an idea by Donald Tapscott from his book 'Office Automation', in which he approximately sets out the various techniques, products and services in the new information technologies, according to what share they have of these three components -computing, communications and office.

The exact situation in this map is a question of opinion, but the diagram illustrates the existing relationship between the different technologies.

The online search systems either compete with, are based on, utilize or rely on some of the aforesaid technologies, and therefore their development will depend on how the latter evolve.

Diagram



Adapted from Don Tapscott

As technologies become more and more refined, they provide:

- better quality
- more capacity
- smaller size and weight
- lower price

Users go on finding new applications for them. For instance, electronic books did not sell well until their weight went down from 7.5 Kg in 1990 to 0.5 Kg in 1992. Although they weigh 20 times less than the equivalent paper books, some readers do not find them so pleasant to read as ordinary books, although this is something that is bound to change in a few years' time when the present day 100 dots-per-inch resolution screens will go up to 500 dpi, and they will look like satin paper.

The application of neuronal networks to recognizing fuzzy information or with considerable interference has led to the upgrade of OCR (Optical Character Recognition) systems to ICR (Intelligent Character Recognition), which makes far fewer mistakes and are capable of 'learning', thus being used in new applications as forms/tables reading.

We have seen how, as their capacity increases or their size decreases, technologies go under the same 'wrapper' -terminals/telephone, fax/answering machine/telephone, modem/fax/telecommunications programme, online search/electronic mail/ digitalized document supply, voice recognition/voice data consulting, computers/LANs/ telephones, fax with a database access terminal, and so on.

Integration does not mean simply the sum total of each component utility, but rather it creates a synergy that increases the potential application of a new service or product. Moreover, every step forward in one of these new information technologies, indirectly helps also other technologies in the sector. For instance, public videotex supports the professional online services by creating a connecting habit, which in turn helps to develop electronic mail services mounted in the same host. CD-ROM competes with online, but it helps to train people who will then know how to make online searches.

2.6.2 Service pricing

The way an online database service is priced affects its use.

The first hosts, Dialog and Orbit, set prices by connection time (breaking away from the tradition, followed by the calculation centres, of invoicing through complex system resource units), as well as offline prints. Online prints were free of charge during the initial years (until 1980).

Invoicing based mainly on time is clear to users, but causes the so-called 'taximeter syndrome', since it forces users to do the searching against the clock in order to keep costs down.

Several factors have proved throughout the years that this kind of invoicing was not optimal:

- Hosts improve their searching systems so that they are becoming ever more efficient; therefore users can connect for a shorter time.
- Users work at higher speed rates -1,200, 2,400, and 4,800- baud and pay the same per-minute-rate as if they were working at 300 baud.
- CD-ROM are successful because the user does not feel the time pressure.
- Pricing by connecting time puts off occasional users (end users) from using online systems by themselves.

In 1987 Chemical Abstracts introduced an important change by making the connection time cheaper and the results obtained more expensive.
In 1989 ESA-IRS began to apply their 'Price for Information', thus practically eliminating connecting time.

The increasing trend towards invoicing by results has been shown in a recent report by Simba Information Inc (1992): 1,400 price changes recorded in 1991 showed a global increase of 18.8% for search result prices and only 5.6% for online connecting time.

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